

UNITED STATES BANKRUPTCY COURT  
SOUTHERN DISTRICT OF TEXAS  
(Corpus Christi Division)

In re	§	Case No. 05-21207
	§	
ASARCO, LLC, <i>et al.</i>	§	Chapter 11
	§	
Debtors	§	Jointly Administered

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DECLARATION OF CAMI GRANDINETTI

Cami Grandinetti declares that:

## I. Introduction

1. The United States Environmental Protection Agency (EPA) spent more than four years investigating the extensive human health and environmental problems in the Coeur d'Alene Basin (the Basin) and developing a remedial approach to address them.<sup>1</sup> EPA worked with several federal agencies, two tribes, two states, four counties, several local governments, and hundreds of interested citizens. More than 17,000 samples<sup>2</sup> of soil, sediment, groundwater, surface water, and other media were evaluated to assist in understanding the widespread contamination of the Basin and how it has impacted human health and the environment. EPA evaluated a range of alternatives in order to develop an approach that would meet the statutory and regulatory requirements for cleanup actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Because of its size and complexity, the Basin project is one of the largest EPA-funded projects in the country. Currently, there are six full-time technical project managers, two part-time technical project managers, two part-time community-relations professionals, one part-time risk assessment professional, and one part-time chemical lab analysis professional working on the Coeur d'Alene Basin project for the Superfund Program. The Basin cleanup approach described in my testimony is based upon this work.

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<sup>1</sup> Contaminated areas of the Coeur d'Alene Basin are part of the Bunker Hill Superfund Site (Site) and are broken down into three operable units. Operable Unit 1 and Operable Unit 2 are located in the vicinity of the former Bunker Hill Mining and Metallurgical facility (Box) and include populated and non-populated areas, respectively. Operable Unit 3 (the Basin) is the rest of the contaminated areas of the Coeur d'Alene watershed located upstream and downstream of the "Box" as well as the river through the Box.

<sup>2</sup> During the Remedial Investigation/Feasibility Study (RI/FS), EPA used historical sampling data, as well as obtaining new samples collected for the RI/FS. More than 7,000 historical data points had been collected from various state and federal agencies in the Basin. In addition to this historical data, EPA collected an additional 10,000 samples of soil, sediment, groundwater, surface water, drinking water, paint, and house dust.

2. In contrast, ASARCO offers the Court completely arbitrary "cost" numbers based on no engineering, scientific, or legal analysis whatsoever. Lacking this analysis, their numbers bear no relationship to any of the legal requirements that EPA must follow to select a remedy under CERCLA. Consequently, their "expected net present value cost for the response actions at the site"<sup>3</sup> could never form the basis for estimating the costs that are likely to be incurred in implementing remedies to be selected by EPA in the Basin.

## II. Background and Experience

3. I have a Bachelor of Science degree in Civil Engineering from the University of Washington and a Master of Science degree in Civil Engineering from the University of Washington. I have been a registered Professional Civil Engineer in the State of Washington since 1996. In my professional career, I have worked within the Superfund Program for the Environmental Protection Agency since 1993. I began my work at EPA as a Remedial Project Manager (RPM), the person with direct-line responsibility for investigating the environmental problems and selecting engineering solutions for hazardous waste sites. I have experience in all phases of the investigation and cleanup process in Superfund. In 1996, I began working as a Remedial Project Manager for this Site on behalf of EPA. Since that time I have worked on implementation of the cleanup remedy for the Site and have managed large multi-million dollar cleanup construction projects. Currently, I am a Unit Manager in EPA Region 10's Superfund program and I manage the team of RPMs that work on the Site.

## III. Site Background

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<sup>3</sup> USCdA119, Supplemental Expert Report of Jeffrey Zelikson and Richard Lane White (LECG), September 21, 2007, at 5.

4. The Coeur d'Alene Basin contains one of the largest and richest mining districts in the world. This district is located in what is referred to as the Upper Basin of the Coeur d'Alene watershed (Upper Basin)<sup>4</sup>, a mountainous region with limited flat space to store mining waste. USCdA144, Figure 1. As a consequence, all mine waste<sup>5</sup> was discharged directly into streams or deposited adjacent to them, enabling mine waste to be washed away during high precipitation flows. It is estimated that more than 100 million tons of mine waste have been disposed of within the Basin over time. Thus, the mining industry depended on the South Fork and its tributaries to carry most of the mine waste downstream and away from mining operations. The waste from the various mining and milling facilities became commingled with downstream soil and sediments and spread throughout the watershed. Over time, the mine waste filled the floodplain areas of the watershed, clogged the tributaries and South Fork and ultimately spread contamination down through Coeur d'Alene Lake and into the Spokane River in the State of Washington. USCdA003, Coeur d'Alene Basin Remedial Investigation/Feasibility Study, October 2001, at 2-1.

5. Over the years, more than 140 million tons of ore have been produced from the mining district, which came to be known as the Silver Valley. USCdA016, National Research Council of the National Academies, *Superfund Mining Megasites: Lessons Learned From the Coeur d'Alene River Basin*, at 32-33. Ore production included approximately 1.2 billion ounces of silver, 8 million tons of lead and 3.2 million tons of zinc. USCdA002, USEPA Record of

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<sup>4</sup> The Upper Basin runs approximately 30 miles along the South Fork from the town of Mullan to the confluence of the South Fork with the North Fork Coeur d'Alene River, near the town of Enaville. The Lower Basin begins at the confluence of the South Fork and North Fork and continues downstream along the Coeur d'Alene River (Main Stem) to Coeur d'Alene Lake, which is a distance of nearly 40 miles. See USCdA144, Figure 1, Basin Map.

<sup>5</sup> Mine waste is comprised of many materials, most significantly jig tailings, flotation tailings, and slimes. Jig tailings are coarser-grained waste materials generated during extraction of metal ore and contain an average lead concentration of 80,000 parts per million. Flotation tailings are fine-grained waste materials and contain an average lead concentration of 10,000 ppm. Slimes are the finest-grained waste materials. USCdA002 at Table 2.1-1.

Decision, Bunker Hill Mining and Metallurgical complex Operable Unit 3, September 14, 2002, at 2-1.

6. Near Cataldo in the Lower Basin, the Coeur d'Alene River changes from a steeper-gradient, higher-velocity river to a lower-gradient, lower-velocity river.<sup>6</sup> As the river slows down in the Lower Basin, it has less capacity to carry suspended material and, consequently, that material will drop out of the river and form deposits. In 1932, the Mine Owners Association, which included ASARCO, constructed a suction dredge near Cataldo to remove tailings from the river in response to the concerns raised by residents in the city of Coeur d'Alene and to preclude possible government restrictions on the discharge of tailings into the river. USCdA145, Figure 2. This dredge pumped about 7,000 gallons of water per minute (gpm), excavated an estimated 500 tons of sediment per hour, and ran about 22.5 hours per day from June through December, from 1932 to 1968. It is estimated that the dredge operations removed 34.5 million tons of tailings. The dredged tailings were deposited in Mission Flats, which is adjacent to the Coeur d'Alene River, covering about 2,000 acres to a depth of 25-30 feet. USCdA016 at 34.

7. Groundwater and surface water throughout the Basin have become contaminated from historic mining activities. Acid mine drainage is created within the subsurface as groundwater flows through the mined-out areas and, in the presence of oxygen, a chemical reaction occurs on these surfaces that lowers the pH of the groundwater and releases heavy metals into the groundwater. Similar chemical reactions occur in the mine waste that has been dumped in surface water bodies, which causes heavy metals to leach out of the mine waste and into the surface water. USCdA002 at 5-6.

8. Mine waste was also dispersed throughout the Basin by the local communities as they used it for fill and construction materials. ASARCO, its predecessors and other mining

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<sup>6</sup> See footnote 4.

companies arranged to have coarse tailings transported out of the floodplain of the South Fork for use as ballast for railroad lines, street and road surfacing, and concrete aggregate. ASARCO and other mining companies also arranged to have railroads transport tailings from their various mills outside of the floodplain of the South Fork. Additionally, the Standard Mill, an ASARCO predecessor, negotiated with the City of Wallace to allow the City to build a tailings chute from the mill to a downstream location from which the City and others could load tailings into wagons for transport elsewhere. The City used those tailings for fill and in surfacing city streets in areas outside the floodplain. Well into the late 20<sup>th</sup> century, parties looking for a source of gravel have used tailings for driveways, fill, and other construction purposes. USCdA095, Amended Declaration of Frederic L. Quivik, November 16, 2004 at 1-2.

#### V. Effects of Contamination

9. The environmental effects of the mining district's waste disposal practices were obvious to communities downstream early in the Basin's mining history. In 1929 and 1930, John Coe, the editor of the Coeur d'Alene Press, wrote a series of articles about the "yellow muck" and "stifling stench" he observed after touring the Lower Basin. In 1932, Dr. M. M. Ellis, a scientist with the United States Bureau of Fisheries, investigated the effects of mine waste on the fisheries and found that:

[t]he polluted portion of the Coeur d'Alene River, that is the South Fork from a short distance above Wallace, Idaho to its junction with the North Fork above Cataldo, and the main Coeur d'Alene River from the junction of its forks to its mouth near Harrison, Idaho was found to be practically devoid of fish fauna, bottom fauna or plankton organisms.

USCdA016 at 36. Dr. Ellis also reported on the extent of contamination, stating that:

[t]he mobility of the mine slimes carried by the Coeur d'Alene River has made possible the pollution of considerable lateral areas, as the flats and low lands adjacent to the river, because large quantities of these wastes are swept out onto the flats during high water, and left there as the river recedes.

USCdA155, Bookstrom et al., *Baseline and Historic Depositional Rates and Lead Concentrations, Floodplain Sediments, Lower Coeur d'Alene River*, 2004, at 13.

A. Human Health Impacts

10. Mining, milling, and smelting activities in the Basin have had serious impacts on human health. Health effects are most severe to young children and pregnant women. Childhood lead poisoning was epidemic in the communities surrounding the Smelter Complex in the Box in the 1970s. In 1974, 97% of the 570 local children tested, had blood lead levels above 40 µg/dL. USCdA159, USEPA Record of Decision, Bunker Hill Mining and Metallurgical Complex Operable Unit 1, 1991 at 2-2. At the time, these blood-lead levels were the highest documented in North America. Currently, the Center for Disease Control defines elevated blood-lead levels as 10 µg/dL or above. USCdA002 at 7-6.

11. The toxicity of lead is well documented and understood. There are extensive human data available from many years of study that link specific health effects to levels of lead in blood. USCdA002 at 7-1 through 7-8. During the mid-1990s, the Agency for Toxic Substances Disease Registry conducted two health effects studies in the Silver Valley, evaluating residents who were exposed to lead in the 1970s. One study evaluated young children exposed following a fire that had destroyed the air pollution control equipment on the lead smelter in the Box; the other focused on former female smelter workers. Both studies found irreversible deleterious effects to the study participants. For example, the study of residents exposed during the fire concluded that subjects had a statistically significant increase in the prevalence of central nervous system symptoms, a significant decrease in performance on neurological tests, and the female smelter workers had a significant increase in difficulty conceiving children. See USCdA162, ATSDR, *A Cohort Study of Current and Previous Residents of the Silver Valley: Assessment of Lead*

*Exposure and Health Outcomes*, 1997; and USCdA163, ATSDR, *Study of Female Former Workers at a Lead Smelter: An Examination of the Possible Association of Lead Exposure with Decreased Bone Density and Other Health Outcomes*, 1997.

12. Lead-induced neurological effects and reductions in IQ have also been confirmed by consensus reviews prepared by EPA, the National Academy of Sciences, the Center for Disease Control, and the Agency for Toxic Substances and Disease Registry. USCdA002 at 7-5 and 7-6.

The 1993 National Academy of Science lead review concluded that:

[t]he toxic effects of lead range from recently revealed subtle, subclinical responses to overt serious intoxication. It is the array of chronic effects of low-dose exposure that is of current public-health concern.... We have several reasons for emphasizing low-dose exposure. As recently noted by (Landrigan 1989), the subtle effects of lead are bona fide impairments, not just inconsequential physiologic perturbations or slight decreases in reserve capacity

*Id.*, at 7-5. The Idaho Department of Health and Welfare, EPA, and the Agency for Toxic Substances and Disease Registry have also studied the effects of lead contamination in the Coeur d'Alene Basin and have issued several reports documenting the chronic and acute effects of lead contamination in the area. Figure 3 depicts the range of effects to children from exposure to lead.

13. Young children are primarily exposed to lead in dust on the floors of their homes. Lead in house dust reflects contaminated soil from the yard, neighborhood, and surrounding community. USCdA002 at 7-2. Young children are most vulnerable to the effects of lead contamination because their brains have not fully developed. Therefore, the population most at risk from exposure to lead is also the population most likely to come in contact with lead contamination in the home or yard through normal behavior, such as crawling and placing hands and other objects in their mouths. Children can also be exposed to lead contamination in the numerous recreational areas located along the Coeur d'Alene River in the Upper and Lower Basin as seen in Figure 4 and at former mining areas, such as mine waste dumps that are located within Upper Basin residential areas, such as can be seen in Figure 5. USCdA145 and

USCdA146.

14. The Idaho Panhandle Health District in northern Idaho has identified children with elevated blood lead levels whose exposure was traced to use of beaches and recreational areas in the Lower Basin. USCdA002 at 7-8. The levels of lead in recreational beach sand/sediment in the Basin is high, averaging more than 3000 mg/kg (parts per million). Average lead concentrations at mine waste dumps in the Upper Basin are much higher, in the 10,000 mg/kg range. USCdA002 at Table 7.1. Therefore, the amount of soil inhaled or ingested that can cause elevated blood lead levels is small, similar to the volume of material contained in 1-2 aspirin. USCdA026 vial of sieved soil sample.

#### B. Ecological Impacts

15. Over the century of mining in the Silver Valley, more than 100 million tons of mine waste have been disposed of within the South Fork and Main Stem Coeur d'Alene River (Main Stem). Consequently, high concentrations of metals have been distributed throughout soil, sediment, and surface water in the Basin. These metals, primarily lead and zinc, pose substantial risks to the plants and animals that inhabit the Basin. Few ecological receptors are unaffected by the risks resulting from mining contamination. The most severe ecological effects include the acute effects of zinc in surface water to fish and aquatic life and the acute effects of lead in sediment to waterfowl. In addition to lead and zinc, cadmium, copper, arsenic, mercury and silver are also significant chemicals of concern. USCdA002 at 7-23.

16. EPA has estimated that there are more than 7 million cubic yards of tailings located within the Upper Basin watershed area. According to mapping conducted by the Bureau of Land Management, approximately 2,850 acres of land in the Upper Basin have been disturbed by mining activities not related to disposal. USCdA002 at 5-6. The former mine and mill sites and

downstream tailings-depositional areas in the Upper Basin serve as the main source of dissolved-metals contamination for the entire Basin ecological system. Most of these Upper Basin sources come from diffuse metal sources, such as the floodplain tailings. Surface water and groundwater flow through these floodplain tailings. The metals, primarily cadmium and zinc, then dissolve or leach out of these tailings into the water and are transported downstream throughout the river system. EPA estimates that these diffuse sources account for approximately 90% of the contaminant load to the watershed. Point sources, such as pipe discharges and adit discharges, comprise a small fraction (approximately 10%) of the dissolved metal contaminant contribution to the system. USCdA002, Figure 5.2-6.

17. Water quality within the South Fork system is severely degraded due to dissolved metal load. Zinc is toxic to fish; the acute aquatic water quality criteria for zinc is 58 ug/l for the conditions within the South Fork system (Idaho Department of Environmental Quality, Idaho Administrative Code, IDAPA 58.01.02.210.01). Zinc concentrations were measured during the 1991 to 1999 timeframe; Figure 6 depicts the average zinc concentration at specific locations within the South Fork. USCdA010. The levels of zinc are consistently more than 10 times water quality criteria. For example, the estimated average concentration of dissolved zinc in the South Fork at the city of Pinehurst is 1,430 ug/l. Because of these high levels of zinc, Ninemile and Canyon Creeks have severely impaired populations of fish or other aquatic life below the mining-impacted areas. Approximately 20 miles of the South Fork and 13 miles of tributaries were unable to sustain reproducing fish populations. In addition, species density and diversity were reduced throughout the Basin. USCdA002 at 5-6. Concentrations of zinc continue to remain elevated today.

18. The Lower Basin provides more than 19,000 acres of attractive waterfowl habitat,

most of which is lethally toxic to waterfowl due to high levels of lead in sediment. Many species of waterfowl, including large numbers of migrating birds, visit the Lower Basin each year. Some species of waterfowl feed by dabbling into shallow sediments to obtain food. During feeding, the birds ingest metals, along with the sediments. Prior to mining, concentrations of metals in sediments were low. The USGS found that pre-industrial sediments in the Basin had a mean lead concentration of 31 mg/kg. USCdA155. As a result of mining, more than 95% of the Lower Basin wetland areas contain sediments that are toxic to wildlife, with lead above 530 mg/kg, the lowest observed effect level for waterfowl. More than 80% of the wetland areas contain sediment with lead above 1,800 mg/kg, the mortality threshold for waterfowl. USCdA003 at 5-7 and 5-8. Therefore, more than 80% of the Lower Basin wetland areas, or 15,200 acres, is lethal habitat for sediment-ingesting waterfowl. Figure 4 depicts locations in the Lower Basin where lead levels exceed 2,000 mg/kg. USCdA011.

19. Wildlife data collected over the past several years by the United States Fish and Wildlife Service has documented waterfowl deaths due to lead poisoning associated with ingestion of contaminated sediments. Analysis of the dead birds reveals that at least 12 different species of birds have died as a result of exposure to the lead-contaminated sediment. Of the dead tundra swans collected by the United States Fish and Wildlife Service in the Basin, 96% died from lead poisoning caused by ingestion of lead-contaminated sediments. Lead exposures and associated injuries to wildlife inhabiting the Basin are anticipated to continue unless measures are taken to reduce lead concentrations in soil and sediment. USCdA002, Section 7.2.

20. Contamination in the Lower Basin, Coeur d'Alene Lake, and the Spokane River results from upstream waste piles and source areas, as well as erosion of riverbed and riverbank materials. The river beds and banks serve as a major source of metals, especially particulate

lead. There are approximately 1.8 million cubic yards of contaminated river banks and 20.6 million cubic yards of contaminated river bed that continue to erode and move through the system. USCdA002 at 5-7. Lead is present in surface water within the suspended sediment. In addition to these solid materials, dissolved metals continuously move through the surface water system in the Basin. The estimated average concentrations of dissolved cadmium, total lead and dissolved zinc in the main stem Coeur d'Alene River at Harrison, as calculated from surface water data collected from 1991 to 1999, are 1.9 ug/l, 52 ug/l and 344 ug/l respectively. Because of this, the Spokane River below Coeur d'Alene Lake has contamination exceeding water quality standards and contains substantial levels of lead in sediment, requiring cleanup to protect recreational users. USCdA002 at 5-7.

21. Although the Coeur d'Alene mining district once hosted hundreds of mining companies, most no longer exist. In fact, ASARCO and Hecla Mining Company are the most significant remaining mining companies in the Basin litigation.

#### IV. EPA's Involvement in the Basin

##### A. CERCLA Process

22. In 1980, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund, was passed by Congress. CERCLA was enacted to clean up sites contaminated by past industrial practices. EPA evaluated contamination in the Coeur d'Alene river system and added the Site to the National Priority List of the Nation's most contaminated sites in 1983.

23. The CERCLA process, which is governed by the National Contingency Plan, 40 C.F.R. Part 300, is used by EPA to investigate the effects of historic contamination and evaluate alternatives for cleaning them up. EPA works with the parties potentially responsible for

contamination, states, Tribes, and other interested parties to evaluate a site through what is known as the Remedial Investigation/Feasibility Study (RI/FS). During the Remedial Investigation (RI), data is collected to determine the nature and extent of contamination. The data is also used to conduct a site-specific risk assessment to determine whether the contamination poses an unacceptable risk to human health or the environment. If the site poses such a risk, the Feasibility Study (FS) evaluates cleanup options to address the risk.

24. Once the alternatives for cleaning up the site have been developed, EPA must evaluate the alternatives against nine criteria: (1) protection of human health and the environment; (2) compliance with applicable or relevant and appropriate requirements (ARARs); (3) implementability; (4) long-term effectiveness; (5) short-term effectiveness; (6) reduction of toxicity, mobility, and volume through treatment; (7) cost; (8) State acceptance; and (9) community acceptance. These nine criteria are broken down into threshold criteria (protection of human health and the environment, compliance with ARARs), modifying criteria (implementability; long-term effectiveness; short-term effectiveness; reduction of toxicity, mobility, and volume through treatment; and cost) and balancing criteria (State acceptance and community acceptance). USCdA031, Evaluation Criteria for Superfund Remedial Alternatives, Figure 8.

25. When EPA selects a remedy for a site after completion of the RI/FS process, it is required to choose a remedy that meets the threshold criteria -- protection of human health and the environment and compliance with ARARs. ARARs are those federal, state, and tribal environmental statutes, regulations and other requirements that pertain to the site. These ARARs are based on the location-specific, chemical-specific and action-specific circumstances for the site. The remaining evaluation criteria are then used to determine the best alternative based on a

comparative analysis of the different cleanup options that satisfy the threshold criteria and represents the best balance of tradeoffs when considering the balancing and modifying criteria.

26. Once EPA identifies a cleanup remedy, it is published as a Proposed Plan and the public has an opportunity to comment on the plan. After comments are received and considered, EPA finalizes the cleanup decision in a Record of Decision (ROD). Once the ROD is completed, EPA attempts to negotiate a consent decree with the responsible parties to implement the selected remedy. If the responsible parties refuse to conduct the cleanup, EPA can bring a lawsuit to compel them to do so, or alternatively, do the work itself and seek reimbursement from the responsible parties later. This is the process that EPA followed in the Coeur d'Alene Basin.

27. At large Superfund sites, EPA typically breaks the site up into smaller areas, or “operable units” to facilitate the investigation and remedy selection process. Because this Site is very large, EPA took this approach. The initial focus for EPA and the State of Idaho was the area immediately surrounding the Bunker Hill smelter complex, due to the extremely high levels of lead in children's blood in the vicinity of the smelter. This area, known as the Bunker Hill "Box," is a 7 mile by 3 mile rectangle that includes the Idaho communities of Smelterville, Page, Kellogg, Wardner, Pinehurst and Elizabeth Park.

28. Within the Box, EPA identified the residential areas as Operable Unit 1 and the former mining and metallurgical facility as Operable Unit 2. An RI/FS was conducted for both operable units. As the RI/FSs for these two operable units were being conducted, EPA initiated several emergency removal actions to mitigate the ongoing lead exposure by cleaning up public areas such as parks and playgrounds, and yards of the most severely contaminated homes in which young children or pregnant women were living. In 1991, EPA selected a remedy for the

residential areas within Operable Unit 1. The cleanup for these areas included removal to a depth of one foot of yard soils that exceeded lead concentrations of 1000 milligrams per kilogram (mg/kg or parts per million), and replacement of the excavated soil with clean soil. In garden areas, the excavated areas were replaced with two feet of clean soil. It is important to note that not all contamination is removed during this cleanup action. Soils contaminated below the one-foot depth of excavation remain on site. The clean soil layer provides a barrier from exposure to contaminated soils located beneath. USCdA159.

29. In 1992, EPA selected a remedy for Operable Unit 2, the former Bunker Hill Mining and Metallurgical facility. EPA was unable to negotiate a consent decree with the potentially responsible parties (PRPs) for all the work required in Operable Unit 2 within the Box because the owners of the Bunker Hill Mining and Metallurgical facility were in bankruptcy. EPA therefore began to implement the cleanup requirements of Operable Unit 2 in late 1994.

30. To date, EPA has spent more than \$350 million dollars designing and implementing cleanup actions within the former mining and metallurgical facility in the Box. Most of those cleanup actions included excavating and disposing of waste materials that were contaminating surface water and groundwater in the area. EPA will take additional actions within the Box that are necessary to protect human health and the environment and comply with ARARs. EPA has been monitoring the Box and the completed cleanup actions and has integrated this monitoring program with the Basin. Similarly, EPA is coordinating remedial actions in the Box with the rest of the Basin.

31. All contaminated areas outside of the Box, both upstream and downstream, as well as the river through the Box, were identified as Operable Unit 3 (the Basin). EPA initiated the Basin RI/FS in 1998.

## V. 2002 Basin Record of Decision--Interim Remedy

32. Numerous parties assisted EPA with studying the effects of mine waste in the Basin during the RI/FS. These parties included the Coeur d'Alene Tribe, the Spokane Tribe, the State of Idaho Department of Environmental Quality, the Washington State Department of Ecology, the United States Geological Survey, the United States Fish and Wildlife Service, the United States Bureau of Land Management, the Idaho Panhandle Health District, and the United States Forest Service. In addition, EPA invited the mining companies to participate in the RI/FS but they declined.

33. During the Feasibility Study for the Basin, EPA evaluated a range of alternatives to address the substantial human health and ecological impacts from mining related contamination in the Basin. These alternatives included remedies proposed by the State of Idaho, as well as a group of mining companies including ASARCO. As mentioned earlier, the mining companies declined to participate in the RI/FS, but they had submitted an expert report in litigation which contained their proposed cleanup actions. EPA used this report to develop a remedial alternative that could be evaluated in the RI/FS. EPA evaluated several cleanup alternatives in the RI/FS. The alternatives varied in many ways, most notably in how extensively the remedy went toward removing, stabilizing, capping and treating the mine waste contamination.

34. As discussed earlier, EPA is required to select a remedy that is protective of human health and the environment, and complies with ARARs.<sup>7</sup> At the end of the Basin RI/FS, EPA determined that the ecological remedies that could meet these threshold criteria involved a tremendous amount of work over a vast area, and included a broad variety of media and source types that needed to be addressed. Due to the size and complexity of the project, a useful way to

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<sup>7</sup> In limited circumstances, EPA has the authority to waive certain ARARs. A remedy, however, must still comply with the statutory requirement of being protective of human health and the environment.

manage the workload is with a phased implementation of cleanup actions. Also, in light of the fact that the mining companies responsible for much of this contamination were refusing to fund Basin cleanup, EPA selected a prioritized subset of cleanup actions that could be managed with limited government resources. EPA expected to receive \$10 to \$15 million dollars per year for cleanup construction, for which Idaho would have to provide 10% matching funds. In order to accomplish this, the Idaho legislature passed legislation that allocated \$1.5 million per year for 30 years to the Interim ROD cleanup. Therefore, EPA selected an Interim Remedy in the 2002 ROD as a first step towards a comprehensive cleanup of the Basin, and schedule implementation over an approximately 20-30 year period. USCdA158, Coeur d'Alene Basin Proposed Plan, October 29 2001.

35. The Interim Remedy includes a plan to protect human health from direct exposure to lead that currently occurs in public spaces and residential areas, including identified recreational areas of the Upper Basin, Lower Basin and the Spokane River above Upriver Dam in Washington State. For ecological protection, the Interim Remedy identified a prioritized subset of cleanup actions from Ecological Alternative 3.

36. Throughout the RI/FS process, EPA worked with a varied group of interested parties. The cleanup actions included in the Interim Remedy provide a good balance among the priorities identified by stakeholders such as the states, tribes, federal trustees, and the public. With respect to environmental cleanup, the Interim Remedy's primary focus is on dissolved metals (primarily cadmium and zinc), lead in floodplain soil and sediment, and particulate lead in surface water. It is expected that the cleanup actions will have incremental, measurable benefits to the environment, but these limited actions will not be protective of human health or the environment.

## VI. Comprehensive Remedy

37. As noted above, the Interim Remedy selected by EPA in the 2002 ROD will not, by itself, meet the statutory and regulatory cleanup criteria of protection of the environment and achievement of ARARs. The Interim Remedy represents a prioritized subset of cleanup actions developed from a more comprehensive approach that EPA recognized was needed to clean up the Basin. A primary purpose of this testimony is to describe EPA's best estimates of what it will take to accomplish cleanup of the Basin. In my testimony, I will refer to this more comprehensive cleanup as the Comprehensive Remedy. In short, as I describe below, effective cleanup of the Basin will require the actions selected in the 2002 Interim ROD as well as the remainder of Ecological Alternative 3, as developed in the Basin RI/FS. USCdA149, Summary of Comprehensive Remedy, Figure 9.

38. In its 2002 Interim ROD, EPA determined that the ecological cleanup alternative for the Upper and Lower Basins that met the threshold criteria and presented the best balance of tradeoffs among the NCP criteria, is Ecological Alternative 3. Ecological Alternative 3 targets most contaminant sources in the Basin outside of Coeur d'Alene Lake through excavation, consolidation, disposal, capping, and treatment. This alternative was not the most aggressive and costly cleanup alternative evaluated in the FS, but it is the remedy that offers fewer short-term impacts to the community, is more implementable and is the least costly alternative that meets the statutory and regulatory requirements. USCdA003 at 10-5. Figure 10 compares the level of cleanup projected for the Interim Remedy and the Comprehensive Remedy. USCdA150, Comparison of Interim Remedy, Figure 10. As can be seen from this figure, the scope of the Interim Remedy is substantial, but it leaves the majority of Basin contamination unaddressed. Because of this, additional actions will be required to meet statutory requirements.

39. The Interim Remedy largely achieves protection of human health in certain key areas

of the Basin. The Interim Remedy addresses human health risks in residential areas of the Upper and Lower Basins. It also provides protection of human health in recreational areas identified for cleanup in the Lower Basin, and in the Spokane River located in Washington. Therefore, the human health remedy is a final action for protection of human health in those locations and is not changed in the Comprehensive Remedy. Outside of these identified cleanup locations, contamination may pose a risk if people recreate or inhabit contaminated areas. Therefore, an Institutional Control Program (ICP) will be necessary to fill the gap left by the human health cleanup actions.

40. It is important to note that although for purposes of analysis, EPA's identified Comprehensive Remedy includes separate human health and ecological components, Ecological Alternative 3 addresses important human health concerns as well. For example, as stated earlier, the human health remedy includes cleanup in isolated recreational areas within the Lower Basin. However, the entire Lower Basin is a continuous contaminated river corridor that is frequented by recreational users throughout the area. USCdA151, Lower Basin Recreational Use, Figure 11. The Lower Basin is located in Kootenai County, Idaho, one of the fastest growing counties in the northwestern United States with a 56% population increase from 1990 to 2000. USCdA164, US Census Bureau, general population and housing characteristics, Kootenai County, Idaho, 1990 and 2000. This area has tremendous economic potential. The Coeur d'Alene Lake area is marketed as a "world class resort" and this serves to further increase the number of people who visit or permanently relocate to this area. As these populations grow, recreational use of contaminated areas within the Lower Basin will increase. Implementation of the comprehensive ecological remedy would address much of the contamination located within the floodplain of the Lower Basin through removal, capping, or stabilization of lead-

contaminated sediments as a way of protecting waterfowl. This cleanup would be protective for human health exposures as well.

#### A. Human Health Remedy

41. The human health remedy addresses exposures to mine waste contamination, most notably lead, in home, residential yard, community, and specific isolated recreational areas. The cleanup will address contamination within soil and drinking water through point-of-use water treatment in the home. In residential, commercial and common-use areas, soil with lead contamination exceeding 700 mg/kg or arsenic exceeding 100 mg/kg will be cleaned up. For soils above 700 mg/kg but below 1000 mg/kg lead, the vegetation will be enhanced through seeding, plantings, and fertilization in order to minimize direct exposure to contaminated soils. For soils that have lead exceeding 1000 mg/kg or arsenic exceeding 100 mg/kg, one foot of contaminated soil will be excavated and replaced with one foot of clean material in order to more effectively minimize direct contact with contamination.<sup>8</sup> It should be noted that EPA's default cleanup level for lead in soil is 400 mg/kg. USCdA002 at 7-2. Based on our site-specific analysis, EPA has selected cleanup numbers for the Basin above this value.

42. The residential cleanup in the Basin will not involve complete removal of contamination, and waste must be managed in place. Therefore, the Basin human health remedy includes an Institutional Control Program (ICP) for management of this waste. The Basin ICP has been promulgated under state law, and the Idaho Panhandle Health District is responsible for management and enforcement. The Basin ICP was developed using the Box ICP as a model. The Box ICP has been in place since the mid 1990s, is well established, and has provided considerable experience in managing more than 3000 remediated properties.

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<sup>8</sup> The State of Idaho is currently implementing the Basin residential cleanup. Based on their experience with this program, the cost of cleanup is approximately \$27,000 per property.

## B. Ecological Component

43. Cleanup actions to address mining contamination typically fall into the following categories: excavation and disposal, consolidation and capping, stabilization, hydraulic isolation through measures such as subsurface containment walls designed to minimize passage of groundwater, and collection and treatment of contaminated water. These remedies are designed to manage large volumes of mine waste and represent standard technologies. The basic principle of these remedies is to separate mine waste from people, water, and wildlife. These actions form the basis for the comprehensive ecological remedy.

44. The goal of Ecological Alternative 3 cleanup actions is essentially to protect fisheries the Upper Basin and waterfowl in the Lower Basin. Therefore, the Comprehensive Remedy in the Upper Basin will include the excavation of approximately 4.5 million cubic yards of contaminated materials and consolidation within local or regional repositories. An additional 8.8 million cubic yards of contaminated materials will be capped in place or regraded and covered. Approximately 9.2 million cubic yards of contaminated material will be hydraulically isolated from surface and groundwater through construction of subsurface slurry walls or other, similar actions. Adit discharges will be collected and treated from 37 sites.<sup>9</sup> It is anticipated that approximately 16 cubic feet per second (cfs) of groundwater and adit discharge will require treatment as part of the completed Upper Basin remedy. USCdA003 at 5-80.

45. Ecological Alternative 3 is a comprehensive remedy for the Lower Basin and addresses the lead-contaminated soils and sediments through excavation and disposal, capping, and stabilization. The Lower Basin includes the Coeur d'Alene River downstream of the confluence of the North Fork and South Fork near Enaville to Coeur d'Alene Lake at Harrison.

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<sup>9</sup> Adits are access tunnels to underground mines. Acid mine drainage created in mine workings located above the adit can flow out of adits by gravity.

It includes the adjacent floodplains, lateral lakes, and associated wetlands. It is estimated that there are more than 19,000 acres of wetland habitat within the Lower Basin. Of the 18,000 acres in the Lower Basin with lead levels above the cleanup level, approximately 7,000 acres will be remediated under the Comprehensive Remedy. This cleanup also includes dredging 20.6 million cubic yards of contaminated riverbeds in order to prevent the ongoing contamination of downstream wetlands and lake areas. Contaminated riverbanks will be excavated as well, which will reduce the potential for downstream recontamination as well as providing a clean river corridor for recreational uses of this area.

46. No cleanup action was identified for Coeur d'Alene Lake due to the fact that the local, state, and tribal entities which have management authority with respect to the lake were working together to manage contamination using their own authorities. At this time, EPA believes this effort is an appropriate approach to managing contamination within the lake. USCdA002 at 12-2.

47. It is important to note that the comprehensive remedy identified through the RI/FS does not include remedies for protection of future use of contaminated groundwater,<sup>10</sup> nor does it include remedies to address potential exposure for those people who may practice a subsistence lifestyle. For purposes of this report, the comprehensive remedy does not assume costs for any actions taken to address these exposures.

## VII. Comprehensive Remedy and Implementation Schedule

48. EPA has developed a schedule for implementation of the Comprehensive Remedy based on the engineering analysis in the RI/FS and EPA's experience in conducting other large remediation projects, such as cleanup of the Box. EPA anticipates that it will be primarily

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<sup>10</sup> The Comprehensive Remedy addresses groundwater as a source of contamination to surface water but does not provide remediation of groundwater for use as a drinking water source.

responsible for implementing the remedy and does not anticipate any significant assistance from the PRPs.<sup>11</sup> This is based on the historical experience EPA has in dealing with these parties. The mining companies have consistently refused to perform work within the Basin and have litigated their obligations since the very beginning of EPA's involvement in the Basin.<sup>12</sup> In fact, while in this proceeding ASARCO is not challenging the need for yard cleanup, it has historically taken the position that residential yard cleanup is not necessary to protect children. With respect to this bankruptcy proceeding, EPA expects that ASARCO will propose a cash payment to resolve its liability rather than perform work itself.

49. The implementation schedule for the Comprehensive Remedy involves separate components of work that can generally be described as follows: residential cleanup, the Upper Basin ecological remedy, the Lower Basin lateral lake remedy, the Lower Basin riverbeds/riverbanks remedy, and the Spokane River remedy. The Coeur d'Alene Basin RI/FS projected that the residential cleanup, the Upper Basin ecological remedy, and the Spokane River remedy could be completed in 20 years. The Lower Basin remedy, which includes the lateral lake remedy and the riverbeds/riverbanks remedy, was projected to take 10-15 years to complete. USCdA003, Part 3 Ecological Alternatives Sections 5.0 and 6.0.

50. As EPA has commenced cleanup activities in the Basin, it has refined the implementation schedule. Therefore, the schedule for implementing the Comprehensive Remedy is with a phased approach to be spread out over 40 years. USCdA014, Implementation Schedule for Cleanup Actions in the Basin, Figure 7. The strategy for the Comprehensive Remedy will be

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<sup>11</sup> Given this history, it is ironic that LECG suggests that EPA does not need to recover its indirect costs because a responsible party might decide to implement the required cleanup.

<sup>12</sup> These parties did sign a Consent Decree to perform work within Operable Unit 1 residential areas of the Box but have litigated all Basin obligations. The mining companies generally complied with the Box Consent Decree until the year 2002, when they informed EPA that they would not meet their legal obligations under the Decree due to a purported change in circumstances. As a result, EPA took over a portion of the work required by the Consent Decree.

to focus initially on completing the residential and recreational components of the remedy. It will take approximately four years to complete all residential and recreational cleanup. As previously noted, there is a need to monitor recreational activity in the Lower Basin until the Comprehensive Remedy is completed. Therefore, as additional areas of human health exposure are identified throughout the Basin during implementation of the remedy, these areas will need to be addressed. The Spokane River cleanup has already begun and is expected to be completed in approximately 4 years.

51. The entire Upper Basin ecological remedy will take approximately 20 years to complete. Within five years, design efforts will begin on the Lower Basin lateral lake cleanup. In year 10, cleanup will begin in the lateral lakes and will continue for 15 years. The lateral lake cleanup will begin in upstream lateral lakes and generally continue downstream until all lake and marsh areas have been addressed. During the lateral lake cleanup, the riverbeds and riverbank cleanup will begin in approximately year 15 and continue for 25 years. The riverbed and riverbank cleanup will also generally be conducted in an upstream to downstream approach in order to minimize recontamination. This staged 40-year implementation will enable EPA to thoroughly evaluate the monitoring data in order to make appropriate adjustments to the cleanup strategy.

52. Implementation of the Comprehensive Remedy will require adding to the scope of cleanup actions covered in the 2002 ROD. EPA can do this by issuing RODs, ROD Amendments and Explanation of Significant Differences (ESDs), which are decision documents authorized by the NCP. RODs and ROD Amendments require public comment and generally require more time to complete than ESDs, although my experience is that they take much less than a year to complete, certainly no more than a year. There is no limit to the number or scope

of these decision documents. EPA has time within the 40-year implementation timeline to continue to conduct the work already included in the Interim ROD and write decision documents to add work required under the balance of Ecological Alternative 3.

#### VIII. NAS report

53. The need for a Comprehensive Remedy in the Basin beyond the Interim Remedy is further demonstrated by the findings of the National Research Council of the National Academies (NRC) after it independently evaluated EPA's work in the Basin. In 2002, the United States Congress instructed the EPA to ask the NRC to conduct this review. The NRC evaluated EPA's scientific approach and decision-making for the 2002 Record of Decision (ROD). In 2005 the NRC issued a report presenting the results of its investigation.

54. In interpreting the NRC report, it is important to keep in mind that the evaluation was conducted on EPA's 2002 Interim Remedy, not the Comprehensive Remedy which forms the basis for the United States' claim against ASARCO in this case. As EPA stated in the Basin Interim ROD, the Interim Remedy is not a final action since it is neither protective of human health and the environment, nor is it compliant with ARARs, and therefore cannot be a final cleanup action for the Basin. Rather, the Interim Remedy is a prioritized subset of actions from the Comprehensive Remedy. Many of the NRC concerns and recommendations focus on the scope of the Interim Remedy and how EPA selected the subset of cleanup actions. Indeed, the main criticism of the EPA Interim Remedy was that it did not go far enough in addressing source areas and the substantial risks to the environment.

55. The NRC identified three key environmental problems that would require additional remedial action based on the limited scope of the Interim Remedy: zinc-

contaminated groundwater in the Upper Basin, lead-contaminated riverbeds, and lead-contaminated waterfowl habitat in the Lower Basin. In the Upper Basin, groundwater is the “primary source of dissolved metals in surface water.”<sup>13</sup> Indeed, “it is virtually impossible for EPA to achieve the water-quality standard by the remedy proposed in the ROD, because it does not address groundwater, which is the largest source of zinc loading to the river.”<sup>14</sup> In the Lower Basin, “The riverbed holds most of the lead...”<sup>15</sup> The riverbed serves as a “conveyor belt” and transports mine waste, predominantly lead, throughout the Lower Basin as contaminated bedload. “It is inevitable that recontamination will occur to some portion or all of what is remediated unless upstream and instream sources are removed or stabilized first.”<sup>16</sup> Finally, the NRC questioned whether “cleaning up only 25% of the basin’s wetlands will provide adequate protection to migratory waterfowl.”<sup>17</sup>

56. The NRC did not believe that the Interim Remedy was aggressive enough in addressing these key areas. USCdA016 at 384 and 386. It is important to note that EPA never intended the Interim Remedy to provide a complete solution to these problems. The Interim Remedy is simply a first step toward the cleanup provided in the Comprehensive Remedy, which does directly address groundwater, riverbeds, and waterfowl habitat.

57. The Comprehensive Remedy addresses sources of groundwater contamination in the Upper Basin by taking cleanup actions with respect to most of the

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<sup>13</sup> USCdA016 at 363.

<sup>14</sup> *Id.* at 363. Groundwater is subsurface water, which comes in contact with mine waste in the Basin and because of this, contains dissolved metals. Groundwater does interact with surface water (rivers and creeks) and adds to the surface water contamination problem in the Basin.

<sup>15</sup> *Id.* at 401.

<sup>16</sup> *Id.* at 381.

<sup>17</sup> *Id.* at 386.

floodplain sediments, tailings, waste rock piles, and adit drainages in the mining district. These features comprise the main sources of zinc loading to the Upper Basin groundwater and surface water. In some locations within the Basin, large existing waste impoundments will not be excavated with EPA's Comprehensive Remedy. However, these areas will be hydraulically isolated from the watershed through measures such as construction of subsurface containment walls and installation of associated groundwater collection and treatment systems. It is estimated that at completion of the Comprehensive Remedy, the concentrations of contamination in surface water would be one-third what they are today and improvements would continue as the system stabilizes after construction. USCdA003.

58. To prevent recontamination and ensure that the Lower Basin remedy would remain protective for both human health and the environment, the Comprehensive Remedy identifies dredging and disposal of 21 million cubic yards of contaminated riverbed material. Removing this material from the riverbed "conveyor belt" will eliminate the ongoing transport of these materials to the lateral lakes, Coeur d'Alene Lake, and the Spokane River.

59. For protection of waterfowl in the Lower Basin, cleanup of waterfowl habitat would be conducted on more than 7,000 acres of the area that is above the cleanup level of 530 milligrams per kilogram (mg/kg). In addition to these cleanup actions, EPA proposes returning some clean agricultural lands in the Lower Basin to wetlands, and thereby creating additional clean waterfowl habitat. USCdA002.

60. An illustration of the differences between the extent of cleanup in the Interim Remedy and the Comprehensive Remedy can be seen in Figures 13 and 14. USCdA152,

Comparison of Cleanup Alternatives in the Upper Basin, Figure 13; USCdA153, Comparison of Cleanup Alternatives in the Lower Basin, Figure 14. As these figures demonstrate, EPA's Comprehensive Remedy addresses more contaminant sources. Therefore, the Comprehensive Remedy is more responsive to the NRC's concern that: "contamination problems in the study area will be solved only when the contaminated materials in the river basin have been removed or stabilized."<sup>18</sup>

61. Another issue addressed by the NRC is the need for adaptive management during implementation of cleanup actions. In essence, adaptive management is a multistep, interactive process that involves developing remediation objectives and benchmarks, as well as a monitoring program to evaluate whether or not the cleanup actions are achieving the benchmarks. Information gained from these efforts is then used to determine whether changes to the cleanup should occur and to determine what efforts are most effective in achieving the cleanup goals.

62. The NRC was highly supportive of using adaptive management in cleaning up the Basin.<sup>19</sup> EPA endorses the use of adaptive management and intends to employ it during implementation of the Comprehensive Remedy. The Comprehensive Remedy includes a monitoring program, involving sampling of surface water, groundwater, soil, sediment and wildlife, for all remedial actions. The environmental data gathered through this monitoring effort will be evaluated, and the status of Basin ecological conditions will be updated periodically. EPA will compare the results against expected cleanup benchmarks in order to decide what improvements, if any, should be made to the design and implementation of further remedial action.

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<sup>18</sup> *Id.* at 11.

<sup>19</sup> *Id.* at 361.

63. EPA has developed a 40-year implementation schedule to provide adequate time for incorporating adaptive management principles into the Comprehensive Remedy. This staged approach will enable EPA to thoroughly evaluate the monitoring data in order to make appropriate adjustments to the cleanup strategy. This approach is consistent with the NRC recommendation that EPA use adaptive management in conducting cleanup actions within the Basin.

64. The NRC also identified the need to carefully plan for waste repositories to safely store contaminated materials excavated during cleanup of the Basin. As the NRC stated: “The process of excavating contaminated soils and disposing of them in a secure landfill has been demonstrated at many Superfund sites.”<sup>20</sup> The committee expressed concern however, over the number of repository locations that had been identified at the time of its review.<sup>21</sup>

65. EPA has always been aware of this issue, and is working with the State to ensure that adequate repository capacity becomes available as needed during remedy implementation. Disposal of contaminated materials will occur in either local or regional repositories. Regional repositories are large disposal sites designed to be centrally located; local repositories are typically smaller disposal sites that are near (e.g., within a half mile of) the contamination. Regional and local repositories will be developed as the Comprehensive Remedy is implemented.

66. Since the NRC report was issued, EPA has continued to conduct cleanup work within the Basin. Part of that work has involved the siting and construction of additional repositories for handling the contaminated materials that are generated during

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<sup>20</sup> *Id.* at 392.

<sup>21</sup> *Id.* at 398.

cleanup. For example, EPA has developed a repository in the Big Creek drainage, and is working with the State and the mining companies to expand the Page repository within the Box. EPA is currently working on the design of a repository in the East Mission Flats area. EPA and the State have established a project team comprised of representatives from federal, state, and local governments; industry; and private citizens to identify locations for future repositories.

67. The two currently operating repositories handle waste from the ongoing residential yard cleanup and can accommodate an additional 680,000 cubic yards of yard waste. This is sufficient for several more years of residential yard cleanup. These existing repositories have been located on top of historic mine waste disposal sites. EPA expects to continue this practice by locating additional repositories on existing mine waste impoundments.<sup>22</sup> Additional repositories will be needed however, in order to ensure that disposal locations are convenient to each community.

68. In the Upper Basin, existing mine waste impoundments have been identified by EPA as potential sites for repositories. One of those impoundments is approximately 50 acres in size and could accommodate nearly 500,000 cubic yards of waste. Raising the impoundment's elevation by only 12 feet would accommodate an additional 1,000,000 cubic yards of waste material. Another historic waste impoundment is approximately 20 acres in size and could accommodate approximately 650,000 cubic yards of material with a 20-foot increase in height. Similarly, historic disposal locations

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<sup>22</sup> For example, ASARCO currently owns approximately 630 acres of highly contaminated property in the Lower Basin that could accommodate all 21 million cubic yards of contaminated materials that would be generated in the Lower Basin during implementation of the Comprehensive Remedy. Under the Comprehensive Remedy, the entire 630-acre area could be hydraulically isolated from groundwater and surface water, making it a perfect disposal location. Prior to the bankruptcy, EPA had discussed with ASARCO the possibility of making use of this location for disposal.

in the Upper Basin could accommodate the volume of waste that will be generated in the Upper Basin during implementation of the Comprehensive Remedy.

69. In conclusion, the NRC identified several key environmental problems that would be left unaddressed by the Interim Remedy. The Comprehensive Remedy provides a more complete cleanup that is designed to address these problems.

#### IX. LECG Scenarios

70. In LECG's initial expert report, they offered the mining company plan developed by Hecla and ASARCO for purposes of the Idaho litigation as the most likely final remedy for the Basin. *See* USCdA116, Overview Expert Report of Jeffrey Zelikson and Richard Lane White, Appendix B-8, June 15, 2007. EPA had specifically analyzed this cleanup plan as part of the Basin RI/FS. As I demonstrated in my Rebuttal Report, this plan failed to meet the legal criteria for remedy selection under CERCLA and was completely inconsistent with the findings of the NRC report. *See* USCdA006, Rebuttal Report of USEPA, August 10, 2007. In LECG's next report, they reduced the probability of implementing the mining company plan to 10%, and assigned a 90% probability of implementing the Interim Remedy.<sup>23</sup> USCdA118, Revised Expert Opinion of Jeffrey Zelikson, August 24, 2007.

71. In yet another addendum that was recently submitted, LECG has completely abandoned the mining company plan. USCdA119. They have also abandoned any attempt at an engineering, scientific, or legal analysis whatsoever. Therefore, the final "scenarios" presented in their latest report are simply arbitrary numbers without any technical basis.<sup>24</sup>

72. LECG's latest position is best illustrated in a decision-tree from their latest report, which is attached as Figure 15. USCdA154, Zelikson Decision Tree. LECG now accepts

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<sup>23</sup> Although the LECG opinion adopted the Interim Remedy, they essentially defined it as a final remedy for the Basin based on the low probability associated with performing additional work.

<sup>24</sup> USCdA122, Zelikson deposition August 30 2007 at 58, 120-128.

implementation of the EPA Interim Remedy. Following implementation, they assign a 70% chance that EPA will take no additional action, except Operation and Maintenance (O&M) of the Interim Remedy. LECG assigns only a 30% probability that after implementing the Interim Remedy, additional cleanup actions beyond the Interim Remedy will be necessary. Within this branch of the decision-tree, LECG assigns an 85% probability that the additional work would cost \$265 million, a 10% probability that the additional work would cost \$935 million, and a 5% probability that the additional work would cost \$2.235 billion.

73. It is crucial to note that there is no technical, engineering, or legal basis for any outcome of the decision tree. As Mr. Zelikson acknowledged in his deposition, LECG did not perform a separate analysis of environmental conditions at the site, rather their strategy "is not attempting to describe a specific strategy or specific set of response actions, but really to focus on a range of costs that might be incurred 30 years from now."<sup>25</sup> This is in striking contrast to EPA's Comprehensive Remedy, which is based on four years of investigation, collaboration with multiple stakeholders, and adherence to the requirements of CERCLA and the NCP.

74. Although LECG provides a number of alternate "cost" scenarios, varying the probabilities of different outcomes,<sup>26</sup> these do not constitute a real sensitivity analysis because they do not include the range of potential activities and associated costs. Their analysis does not even include implementing the Comprehensive Remedy described in this declaration and discussed in my report of June 14, 2007. USCdA005, Report of USEPA Comprehensive Cleanup Approach for the Coeur d'Alene Basin, June 14, 2007. Although the scenarios do include references to EPA's Ecological Alternatives 3 and 4 from the RI/FS, they do not present a realistic implementation schedule, such as presented in the Comprehensive Remedy. Their

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<sup>25</sup> *Id.* at 120.

<sup>26</sup> USCdA119.

timeline is skewed toward the future, which has the practical effect of greatly discounting the cleanup costs. LECG has provided no technical justification for their timeline.

75. As noted above, the scenario that LECG argues is most likely (70% probability) assumes that no additional action, except O&M, will be taken by EPA after implementing the Interim Remedy. In effect, LECG is treating the Interim Remedy as a final remedy for the Basin. EPA never intended the Interim Remedy to be a final cleanup for the Basin. The record (Proposed Plan and Interim ROD) clearly demonstrates that the Interim Remedy will not meet the statutory and regulatory requirements to be protective of human health and the environment and attain ARARs.

76. Moreover, given the findings of the NRC discussed above, it is inexplicable how LECG can assign a 70% probability that no further cleanup actions will be required beyond the Interim Remedy. The Interim Remedy does not address, and was never intended to address, three of the key environmental problems in the Basin identified by the NRC: zinc-contaminated groundwater in the Upper Basin, lead-contaminated riverbeds, and waterfowl habitat in the Lower Basin. The NRC specifically noted that it would be necessary to remediate these media in order to meet the statutory and regulatory requirements for cleanup of the Basin.<sup>27</sup> LECG completely ignores these issues. Their decision tree assigns a 70% probability to never remediating Upper Basin groundwater or Lower Basin riverbeds. Furthermore, none of LECG's alternative "scenarios" provide adequate funding for addressing these problems. Indeed, applying the probabilities LECG assigns to the scenarios assures that there is nowhere near the necessary funding.

77. In addition, all of LECG's scenarios assume that additional work will not commence for 30 years. There is no technical basis for this delay and LECG has

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<sup>27</sup> USCdA016 at 386.

provided none. As I have discussed above, the Comprehensive Remedy can be effectively implemented over the course of 40 years.

78. LECG's proposed delay in conducting cleanup actions beyond the Interim Remedy results from the arbitrary timeline that they impose upon implementation of the Interim ROD. LECG proposes 12 years of remedial work in the Upper and Lower portions of the Basin, followed by at least 16 years of monitoring before potentially commencing any additional work. There is no technical justification for this delay. Furthermore, this is contrary to the intent of CERCLA, which is to expeditiously address risks posed by contaminated waste sites.

79. Moreover, LECG's 16-year delay in implementing cleanup actions beyond the Interim Remedy cannot be justified by principals of adaptive management. Adaptive management involves developing a cleanup plan that incorporates monitoring, data evaluation, and flexibility to incorporate an increasing level of knowledge gained by the monitoring data. EPA has been conducting cleanup for more than two decades in this Basin and has incorporated adaptive management in those cleanup actions. It will continue to incorporate adaptive management into future cleanup actions in the Basin as part of the Comprehensive Remedy.

80. The implementation schedule that I have outlined here is consistent with recommendations from EPA's National Remedy Review Board (NRRB). The NRRB is a group of agency managers who review all remedy decisions that exceed \$25 million. In 2001, the NRRB reviewed the remedy selection process for the Basin. The NRRB recommended that EPA implement Ecological Alternative 3 in phases, commencing with activities such as the Interim Remedy. The NRRB did not prescribe any fixed timeframe

for implementation. The 40-year implementation timeline that I have described here is consistent with the NRRB recommendations as it provides a phased approach to cleanup.

81. None of the LECG scenarios could form the basis for a final remedy decision by EPA and therefore cannot be used to define cleanup costs for the Basin. The appropriate way to determine what cleanup actions will be required and what they will cost is prescribed by CERCLA and the NCP. This is the process that EPA has used in developing the required cleanup and estimate of costs for the Coeur d'Alene Basin.

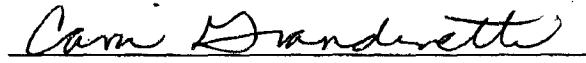
82. The Comprehensive Remedy is admittedly expensive, but the human health and environmental problems at the site are enormous.<sup>28</sup> EPA has already spent more than \$400 million on investigations, designs, construction, monitoring, and all the other requirements associated with cleaning up the Box and Basin. EPA and the State of Idaho have been involved in the Basin for three decades and have shouldered the financial burden of this Site for nearly 20 years. Both agencies are committed to protecting the citizens who live and recreate in the watershed as well as protecting the ecosystem. EPA is responsible for addressing human health and environmental problems for sites listed on the National Priorities List and cannot shirk this responsibility simply because the parties responsible for the contamination believe the problem is "too big" or the expense "too great" to address.<sup>29</sup>

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<sup>28</sup> In fact, the cost of the Comprehensive Remedy is comparable to other cleanups when the size of the site is accounted for. For example, the Stringfellow, Operating Industries and Casmalia Sites in California ranged in size from only 17 to 252 acres, yet the estimated cleanup costs ranged from about \$300 to over \$600 million. Similarly, the estimated cleanup costs of remedial alternatives for the lower 8 miles or about 650 acres of the Passaic River in New Jersey ranged from \$900 to \$2,300 million. By contrast, as I have described in my testimony above, the Basin cleanup will include well over 7,000 acres.

<sup>29</sup> USCdA122, at 57.

Persuant to 28 U.S.C § 1746, I declare under penalty of perjury that the foregoing is true and correct. Executed this second day of October, 2007 at Seattle, Washington.



Cami Grandinetti  
Unit Manager  
U.S. Environmental Protection Agency